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The Fear of the light. Mapping modern cave use strategies in Kythera Island caves.

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Abstract

This paper aims to present the modern uses of caves on Kythera Island, Greece as they have been recorded by the Cerigo Speleological Project. Twenty-seven caves have been recorded during the programme, all of which have evidence of human uses that are divided into two large categories, that is, cave-churches and barn-caves. By analyzing how people shaped and organised space and the different ways and practices of people in the caves through the use of advanced mapping and GIS methods, the ways in which people interacted with the environment of the cave and its characteristics have been highlighted. While observing the decision-making process involved in the ways of using the caves today, a discussion is generated as to how valid the two theories are concerning the use of the caves in the Neolithic Aegean and in the eastern Mediterranean area in general. The first theory suggests that people chose caves with different micro-environmental characteristics appropriate for each different use whereas the second theory claims that people did not settle in caves permanently but occasionally or seasonally, depending directly on the economic activities of the neighboring settlements.

Keywords

Kythera, Cave Using, Barn Caves, Church Caves, Speleology, Paperless Mapping

Introduction

Since the 1970s and the introduction of middle-range theory, ethnoarchaeology has passed through different theoretical stages. Early on, archaeologists believed that the study of traditional societies was the fundamental way to interpret archaeological data (David and Kramer 2001). In the 1990s, the way in which ethnoarchaeological research contributed to the archaeological investigation changed and ethnoarchaeology started playing a supporting role (David and Kramer 2001). However, the observation of how traditional societies live today is still a valuable means of understanding how people lived and interacted with the natural environment in the past.

A research project took place on the island of Kythera, Greece between 2009 and 2013 with the aim of locating, mapping, and studying the modern uses of caves of the island. After four research expeditions on the island, eighty-six caveforms had been recorded and studied. Most of them are small horizontal caves but there are eighteen marine caves and nine potholes as well. The different uses of the caves as chapels, barn places, storage areas, and even as a gun emplacement from WWII were recorded by the research team (Trimmis and Filippatou 2011). However, the purpose of this paper is to

focus on the two major categories of cave use. Specifically, caves were most used for economic and ritual/social purposes. This is not the first research attempt to study caves ethnoarchaeologically, especially as places for ideological expression. Internationally, there are various pieces of work that aim to observe modern cave space exploitation and to create links with the ways in which people exploited caves in the past (e.g., Ishihara-Brito and Guerra 2012; Woodfill 2014; Andreassen et al. 2009).

Because of the fact that cave use has slightly changed in the Aegean basin from prehistory until now (Trimmis 2015), research has focused more on how people used to organise cave space, how they interacted with micro-environmental characteristics of caves for different uses, and why people came to choose caves for their needs[1]. These questions are categorized in order to highlight modern social strategies of cave exploitation and use. These strategies could provide valuable information to the archaeological research of South-eastern Europe and the Eastern Mediterranean on the general social exploitation of the landscape diachronically.

Before we continue with the Kythera project, it is essential to highlight the cave features that were investigated. The most important geological and geographical impact factors in archaeological cave research are the elevation of the cave entrance, the morphology of the cave (horizontal/vertical, narrow passages/big chambers), the rock within which the cave was formed, the speleogenesis procedure, the cave depositional process, and the hydrogeological data of the cave (Heydari 2007). The basic ecological micro-environmental impact factors are the fauna (especially bats) and the light zones of the caves (light, twilight and dark zones). On one hand, all these factors create an inhospitable environment that is difficult to exploit and make use of. On the other hand, there are factors that create a place with distinct characteristics for human exploitation as well. For instance, it is difficult to coordinate activities in the absolute darkness in the interior of a cave. However, the darkness, the high humidity, and the stable temperature throughout the whole year create an ideal space for storage and the safekeeping of goods.

The Island and the Caves

The island of Kythera (also known as Cerigo) is located in southern Greece between the mainland and the island of Crete (map 1). The land of Kythera covers 279,593 km2 while the highest elevation is Mermigaris Mountain at 506m above sea level (Lazarides 2011). During the Cerigo Speleological Project, eighty-two caves of the island were surveyed and investigated. The majority of caves in Kythera are developed in the limestone-covered area of Tripolis limestone on the basis of the number of caves per lithological type analysed. However, the number of caves found there is explained by the fact that on one hand, the limestone covers a large part of the island and on the other hand, by the fact that it can be traced on the western as well as on the eastern coasts where marine caves are also formed (Lazarides 2011). In comparison, a great number of caves appear in the Neogene Deposits and some in the Pindus limestone, where they can almost always be found in areas where they are integrated in flysch. Most likely, there is

[1] The purposes of cave exploitation seems to remain the same since the Neolithic in the Aegean. People still use the caves for economic and ritual/social reasons. Caves have been exploited and transformed in barns, storage areas, chapels, and habitation spaces almost in the same way they used to be in the Prehistory (Trimmis, 2015).

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a connection between the hydrological mechanisms that create the respective sources of contact in these rocks (Lazarides 2011).

Twenty-seven out of the eighty-two caves show indications of human use that date back to the 12th century AD and later. These uses are divided into two large categories: caves that have been turned into barns and ones that have been turned into churches. Ten out of the twenty-seven caves are barns whereas the remaining seventeen are churches. Seven out of the ten barn-caves were in use when they were visited by the research groups, some of them in a state of permanent organized livestock settlement (C-Stani, Stani tou Papa) and others in a state of occasional use by shepherds (e.g., Niorou, Kalogerou, Cyclope's). Humans to serve the needs of livestock pen herding have internally modified all these 10 caves. What arises from conversations with shepherds in Kythera Island, who continue to use caves for pen-herding activities, is that the special organization of the available space contributes not only to the easier management of the livestock but also to the organisation of the general activities of a shepherd such as milking, mating, nursing, and more (Trimmis et al. 2012). It is also contributes to the stabling of different species in the same place (e.g., sheep with goats) and it leaves free space for the storage of objects and forages or even for the accommodation of the shepherd (only in the cases of Lachnos and Manri tou Papa caves) (Trimmis et al. 2012). The spatial arrangement of the interior is usually achieved with the construction of either dry walls that block the entrance or dry walls and posted fences that arrange the interior of the cave. The posts function complementarity in dry walls and it is never used autonomously. Cement blocks were also used in two caves (Anonymi Vrachoskepi and Charampos tou Cyclope) to block the entrance. The shaping of the interior of the cave with post fences and dry walls is a phenomenon that has been observed with safety from the beginning of the Middle Neolithic period (MN) in the Aegean Basin (Trantalidoy et al. 2010). All the caves are small cavities in their entirety (the largest does not exceed 40 m in length) and they are lighted by the natural light. They also have a low level of humidity. The position of every cave has been carefully chosen because they are close to roads and springs or collectors of water (the longest distance from a water spring is 400 m on the straight and it belongs to the cave Anonymi Vrachoskepi) (Trimmis et al. 2012).

Fourteen of the caves-churches are still in use while three of them have been abandoned. In fact, the cave-church of Agios Artemios in Vythoula near the village Potamos was known neither by the research team nor by the residents of the area. A certain church of Agios Artemios was mentioned in the Codex of Churches of the island by the bishop, Nektarios Venieris, in 1697 (Kolovou 2011) but no one had traced it and as such, it was believed that this church was an open-air location and not in a cave as it was actually discovered to be. The churches that have almost been abandoned and are nearly deserted are the Church of Agios Georgios in Mitata and the Church of Agioi Anargyroi in Spakolagado. Both are located on hiking paths and are often visited. Nevertheless, they have not been conserved since the 1950s, when the use of the wider area of the church for farming came to an end. All three architectural types of churches are identified in the caves of Kythera; the Independent one, where the church is a separate construction that is just an extension or the whole of the interior of a cave, the Semi-Independent one, where the church uses a part of the cave as a wall or a ceiling or both, and finally, the Dependent one, where there is no construction and the cave itself is the

church with an addition of a High Altar and, in some cases, of a Templar[2] [3].

Similar in-cave spatial organisation strategies has been observed by Niels Andreasen during his project (under the aegis of the Danish Institute of Athens) in Pelion mountain - East Thessaly (Andreasen et al. 2009). However, Andreasen's project based particularly on interviews and surface artefact analysis and not on the evidences from the spatial usage of the caves' interiors. The Danish project in Pelion highlighted the importance of the caves of the modern societies and indexing the different uses of the caveforms. Andreasen indexed caves in 12 main types of modern usage: a) Dwelling, b) Short term Shelter, c) Agropastoral, d) Storage, e) Refuge, f) Quarantine, g) Mining/quarrying, h) Spiritual, i) Burial, j) hunting stand, k) Leisure, and l) research (Andreasen et al., 2009:180). Excluding the type (l) about the caves that has been used for research purposes, all these 12 types can be organised in two big bins. A) Economic and B) Ritual/ Social. Categories a, c, d, g, and j are organised around the Economic purpose of cave exploitation and the rest around the Social/Ritual factor. The types of cave using that Andreasen presented are more or less the same types that archaeologists use to describe the Neolithic types of cave using (e.g., Sampson 2006; Trantalidoy et al. 2010; Trimmis 2013; Tomkins 2009; Mavridis and Tae Jensen 2013).

Methodology and Techniques.

Almost every mapping problem in open-air site research has found a solution since the introduction of total station systems to archaeological research. However, in cave archaeology, the most efficient technique for cave and artifact mapping is still the "compass and tape" method (Moyes 2002; Stratford 2011). There are a lot of reasons why the total station is useless beyond the first meters of the cave entrance. Narrow passages, darkness, mud, and the various cave decorations constitute the major factors. At the same time, the "compass and tape" technique presents many disadvantages such as the low accuracy and the possibility of making a major mistake when it comes to archaeological research (Stratford 2011; Trimmis 2013).

In the Kythera project, a new technique was used to map the caves. "Paperless mapping" is a technique that is based on the Leica DistoX laser distance meter and the PocketTopo mapping software. A retrofitted Leica DistoX with a digital compass/clinometer is an "all in one" system that sends the measurements using Bluetooth to a PDA computer, which runs the PocketTopo software[4]. Thus, the researcher can collect the data and draw the basic map inside the cave in real time. As a geo-database and georeference background, the research team used the cave mapping program Visual Topo, which is completely compatible with the PocketTopo. In addition, the GIS open access program "QGIS" has been used for the final analysis of the data. The use of the "paperless mapping" method reduced the accuracy errors to a minimum and

[2] Independent: Agios Eleftherios, Agios Antonios and Panagia Odigitria. Semi-Independent: Agios Artemios, Agioi Anargyroi, Agia Sophia (Kalamos), Panagia Orfani, Panagia Spiliotissa, Agios Ioannis, Agios Georgios, Agia Sophia (Mylopotamos), Agia Ekaterini (Mylopotamos), Agios Ioannis, and Agios Pavlos. Dependent: Ag. Sophia (Ag. Pelagia), Agia Pelagia, and Agia Aikaterini (Kapsali).

[3] about the categorisation of the cave churches: Trimmis, 2015: 36

[4] about the 'paperless mapping' technique and its adaptation in cave research: http://paperless.bheeb.ch/ along with Trimmis, 2013 and Redovnikovic et al., 2014.

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increased the mapping speed. Moreover, with the new method, it was easier to collect more data and take more measurements from the interior of the caves in comparison with the traditional compass and tape technique. Additionally, the lumens scale has been used for light zone mapping. Using a SAMPO photometer, the light zone is measured from 500> lumens, the twilight zone from 0.1 to 500 whereas the dark zone of the cave is measured at 0 lumens. An attempt was made to measure the light zones of the caves at noon. However, the brightness of the cave interior is a factor related to the morphology and the orientation of the cave entrance as well. As regards spatial analysis, the permanent constructions in the cave sites and the correlation between them and the ecological data from the caves were studied. The main goal was to create heat maps of cave usage according to the density and the type of use.

Patterns in Caves

In a macroscopic analysis of the two categories of cave usage, some specific distinctions have been observed in the distribution of use depending on the rock where the cave is developed as well as on its altitude. Moreover, a significant preferential differentiation with regard to light zones was also taken into account. With regard to the rock formation, the caves that are chosen to be used as cave-churches seem to lie on limestone. On the contrary, no such preference seems to apply to the cave-barns: there are an equal number in marls and in limestone. Where there seems to be a great differentiation of preference is in the light zones. The vast majority of cave-churches are constructed in the well-lit zone of the cave near the entrance while the rest of the cave remains unused in its natural state most of the time (fig. 2). In contrast, in the cave-barns, people took advantage of all the light zones with the darkest part of the cave featuring the main constructions and the largest number of finds (twilight and dark zone) (fig. 1).

An important differentiation was also noticed in the altitudes of the entrances of the caves as well. The cave-churches are found either in very low altitudes (below 100m) or in high altitudes (above 230m). On the other hand, the cave-barns are mainly located in altitudes between 80-220m. This distribution of the barn caves can be easily understood as the land at these altitudes of the island are mainly used for grazing, around which the caves in question[5] were recorded.

While studying the distribution of the caves that have been used by people, it was observed that the caves are organized into groups around four villages. More specifically, the group around the village Potamos includes three cave-churches (Agios Eleftherios, Agios Artemios, and Agia Sophia) and a cave-barn (Mavrilas). The group around the village Mylopotamos includes four cave-churches (Agioi Anargyroi, Agia Sophia (pic. 1), Panagia Orfani, and Agia Aikaterini) and three cave-barns (Charambos in Limnaria, Stavrou (pic.3), and Lachnos (map 2)). The group around the village Mitata features five cave-churches (Panagia Spiliotissa, Agios Ioannis, Agios Georgios, Agios Antonios, and

[5] Such is the altitude around the village Mitata. In this area, four barn caves (caves of Niorou, Kalogerou, C-Stani, and Stani tou Papa) are located in a similar altitude (170-210m). In fact, around Mitata, which is the main livestock breeding village of the island, many artificial caves are located that have been turned into areas for stabling animals. These are not included in the research, the object of which was the study of the uses of natural caves.

Panagia Odigitria (pic.2)) and four cave-barns (Niorou, Kalogerou, C-Stani, and Stani tou Papa (pic. 4)). Finally, the group around the village Kapsali includes five cave-churches (Agia Sophia, Agia Pelagia, Agia Ekaterini, Agios Ioannis, and Agios Pavlos (map 3)) and two cave-barns (Vigla and Cyclope).

This connection of the caves with the settlements is not random. The caves are occasionally used by the residents of the villages to meet the needs that were created by the exploitation of the countryside by the settlement (for instance, livestock farming). The shepherd used to live, and still lives, in his house in the settlement, where the main area for the sheds of the animals used to be. However, in spring and in summer, when there was food for the flock in the countryside, the shepherd would take the animals to a natural cave so that he wouldn't have to build a new barn from scratch. He would only need to adapt an already existing natural enclosed area to satisfy his needs. Similar needs were met by the church caves as well such as the cave churches of Agios Artemios in Potamos, Agioi Anargyroi in Spakolagado, Agia Aikaterini in Mylopotamos, and Agios Georgios in Mitata. These particular churches were situated around the villages on the valley cliffs that used to be farmed. The people would use these churches in periods when they would transfer their whole household to the countryside for agricultural purposes, such as reaping and vine and oil harvest.

Nonetheless, some cave-churches were permanently occupied and constantly used throughout the whole year. Such are the churches of Panagia Orfani, of Agios Antonios, of Odigitria, and of Agios Ioannis en kremno. The common characteristic of all of the above churches is that they constituted small monastic centres or hermitages. Even in this case, it seems that the churches were not a great distance from the settlements and that there was constant communication between the monks and the settlement.

Discussion

It appears that the people in Kythera used the natural caves to meet specific strategic needs. Life in the countryside of Kythera during the nineteenth century until the middle of the twentieth century followed agricultural activities and the cycle of the seasons. In times when transportation was difficult, for instance, during the reaping and the vine and oil harvest, the entire family would leave their house in the settlement and would relocate for a period of time to their farmhouse, which was within, or very close to, the fields. The characteristics of the farmhouses of Kythera (vokolea or koumos in the local dialect) are: a small space (20-30 m2) where all the family lives, space for the stabling of domestic animals, and large storage areas for agricultural products (Kassimatis 1987). The koumos has certain other characteristics as well, such as small openings, a low ceiling in the interior, and thick walls so that the room maintains a stable temperature between the seasons (Kassimatis 1987). Evidently, the caves present approximately the same characteristics as the residences of Kythera, while at the same time, they avoid the same cost of construction and maintenance. Therefore, when there is a cave available, people seem to prefer it and adapt its interior to organize their daily activities[6].

[6] We can trace seasonal habitation in the caves in the way that people inhabited 'Koumos/ Vokolea'. A particular area dedicated to the family and a different area has been used for the livestock and the goods' storage.

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With regards to prehistory, two main theories on the use of the caves by people during the Neolithic period, which could be further discussed with respect to the findings of the research in Kythera, appear among the researchers of the caves of the wider area. According to the first hypothesis, people used the caves depending on their micro-environmental characteristics. That is to say, they used the darkest areas of the cave to store goods and stable animals whereas they used the lighter parts for daily activities (Sampson 2006; Trimmis 2013). According to the second theoretical approach, the caves acted as satellites of permanent settlements that satisfied the needs of the residents of the settlement related to the countryside (such as pastoralism, fishing, graze, harvest, and hunting) (Sampson 2006, Trantalidoy et al. 2010).

As far as the social organization of the time is concerned, if these theories apply, they paint a picture of a society that had a great knowledge of the micro-environment of the cave and made specific choices to meet specific needs. Although it is hard to define whether these choices were the product of community organization or of individual actions of various households, they bring to light a society that studied its environment and adapted their needs to its characteristics.

In Kythera, it seems that the modern societies constituted such strategies of exploitation of the micro-environment of the caves. Hence, in the cave-barns, the areas for the stabling of the animals always occupied the darkest part of the cave. In the case where the cave is not deep enough, the entrance of the cave was altered and there was a small opening left for the shepherd and the sheep to enter. Such is the case at Charambos in Limnaria. With the purpose of managing the livestock and separating the animals from the storage area of agricultural products in the most efficient way, in most cases, a post fence was built with reeds or wire (Caves of C-Stani, Stani tou Papa, Cyclopes, Niorou, Kalogerou, Stavrou, and Lachnos) whereas in two cases, dry-stone walls were built in the interior of the caves (Grias Kakomarienas and Mavrilas). While discussing these practices of space organization with shepherds who use the caves to stable animals in Crete and in Kythera today, the reason the animals were confined to the interior of the cave in a specific area is explained by the fact that the shepherds used the rest of the cave for their own use as well as for feed storage.

At the same time, according to research, similar practices of space organization have been located in caves that were used during the Neolithic period. In the caves of Koromilia (Trantalidoy et al. 2010), Kataraktes Sidirokastro (Trantalidoy et al. 2010), and Saracenos (Sampson 2008), postholes have been excavated in the interior of the caves while a dry-stone wall has been revealed in the case of Koromilia (Trantalidoy et al. 2010). In all three cases, according to the excavations, the cave had been used for pastoral practices. Except for the caves that show indications of space organization with specific constructions, there is a differentiation in the use of the interior of the cave in other cases as well. For instance, in the cave of Kalithies in Rhodes, the areas where the food production took place was separate from the areas where large storage utensils were found in situ (Sampson, 2006). There are respective similarities between the archaeological and the ethnographic data from the caves that hosted ritual practices as well. For instance, in the cave of Za in Naxos (Zachos 1996), despite the large size, the archaeological findings are confined to the first chamber of the cave, which was lit with natural light.

The cave use strategies didn't change significantly into the Classical antiquity. Sporn's paper (2013) highlighted the importance of caves as sacred places and with a discreet social impact. The use of the cave interior seems to follow the same patterns with the modern examples at least from Kythera. Questions that have been raised in Sporn's paper (2013:207) such as the regional preferences in cave using, the links between the cave as natural place, and the ritual activities and the general discussion about the spirituality of the cave space, are still open to discussion. Field working in modern cave-churches is a very helpful tool to understand the idea of cave as a sacred place.

Looking back in the prehistoric Aegean, the natural caves seem to have been continuously used by people since the Neolithic period for the same reasons and strategies. Greece is estimated to have more than 10,500 recorded caves (Trimmis 2015). Italy, Sicily, and Anatolia present similar geological characteristics (Trimmis 2015). The cave is an enclosed protected area that is easily accessible to cover each dimension of life in the countryside (economical, ideological, and cultural) without requiring significant attempts to adapt it. The research in Kythera highlights the fact that people take a further step by not only selecting which cave they will use for each one of their activities but also by choosing how to use it by appropriately fashioning its interior.

Evaluating the outcomes of Cerigo Speleological Project along with Pelion Cave Project the caves in Greece seems to be an important part of the landscape exploitation, even for the contemporary societies. Especially in Kythera, people still use the cave chapels through the year for divine and special occasions such as christening and weddings. Barn caves are also used today and is a valuable ark of information about traditional production activities in cave environment; between Pelion and Kythera, people in Kythera seem to be more actively involved today with the cave environment.

In the introduction, it was mentioned that it is well known that the direct and thoughtless deductions between present and past are a grey zone for the archaeological research. As such, it is hard to assume that because people follow specific methods and practices for the exploitation of the caves in Kythera today, the case was the same in the Neolithic period, too. What can be deducted is that the uses of the caves in modern Kythera seem to integrate with the theoretical approach toward the use of the caves in the Neolithic period. The analysis of the space organization of the archaeological data in the caves is the next step in understanding of the use and the exploitation of this unique environment since societies of the Neolithic period.

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